

9 CUMULATIVE IMPACTS

A cumulative impact is defined in the CEQ regulations as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR Part 1508.7). Cumulative impacts have also been discussed in the CEQ report *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997b). The analysis in this section is based primarily on existing NEPA documentation and Sections 2 through 8 of this report.

9.1 THE 1992 EIS/EIR ASSESSMENT

The 1992 EIS/EIR (DOE 1992) identified cumulative impacts of the continued operation of LLNL within each topical section. These discussions identified how impacts from operations related to regional impacts and when the cumulative impact was considered significant and unavoidable. Where appropriate, mitigation measures were defined.

Cumulative Impacts

- ◆ 1992 EIS/EIR: Cumulative impacts were identified, their significance was determined, and mitigation measures were recommended when appropriate.
- ◆ 1992–1997: Declining employment reduced LLNL’s contribution to population-related community and regional impacts. Emissions of tritium were reduced approximately fourfold. Mitigation measures were employed to reduce impacts to vegetation, wildlife, threatened and endangered species, and wetlands.
- ◆ 1998–2002: Cumulative impacts related to regional economic and population growth are expected to continue through the year 2002. A relatively stable workforce will not substantially increase LLNL’s contribution to population-related community and regional impacts. Emissions of tritium will be well within the bounds described in the 1992 EIS/EIR. Mitigation measures for vegetation and wildlife, threatened and endangered species, and wetlands will continue to be employed. Construction of NIF and other facilities would result in particulate emissions (PM₁₀) in a nonattainment area. Other sources of such emissions include land development, agriculture, and natural processes. Water use through the year 2002, including the NIF and TSF, would remain essentially the same as 1992 EIS/EIR projections. Electrical power consumption through 2002, including NIF and TSF, would be greater than projected in the 1992 EIS/EIR, but would not significantly affect the ability of local providers to support LLNL needs and the needs of local customers. No other federal or non-federal actions have been implemented or are reasonably foreseeable that, in combination with LLNL and SNL activities, could have an adverse cumulative impact not anticipated in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cumulative impacts is not needed at this time.

Potentially significant and unavoidable cumulative impacts identified in the 1992 EIS/EIR included the following:

- Socioeconomic impacts, including those to community services, that resulted from an expanding workforce;
- Impacts on vegetation and wildlife of surrounding development;
- Impacts on threatened and endangered species from regional development in the vicinity of Site 300;
- Impacts on wetlands from regional development in the vicinity of Site 300;
- Increase in airborne criteria pollutant emissions at LLNL and surrounding communities;
- Incremental addition to highway noise in Livermore;
- Increase in traffic congestion;
- Increase in water demand and consumption and other utility services as a result of surrounding development;
- Increase in waste generation, treatment, and disposal; and
- Shipment and use of hazardous or radioactive materials.

The 1992 EIS/EIR also addressed the impact of normal site operations, including radiological dose and consequent health effects.

9.2 CHANGES FROM 1992 TO 1997

During the period from 1992 to 1997, the Livermore region experienced continued economic growth. Decreasing, rather than increasing, LLNL employment during this period would have acted to reduce the potential contribution from LLNL's operation to (1) regional socioeconomic growth, (2) demand for community services, (3) regional development, (4) highway noise and traffic congestion, (5) air pollutant emissions from mobile sources, and (6) demand for water and other utility services. Vegetation and wildlife, threatened and endangered species, and wetlands would continue to be adversely affected by regional

development as well as by LLNL operations; however, LLNL's reduced contribution to regional growth might have had a minor role in reducing adverse cumulative impacts. Likewise, regional impacts of waste generation and management practices would have been reduced by LLNL's pollution prevention activities, implementation of more efficient waste handling and treatment, and construction of new treatment and storage facilities.

During the years from 1992 to 1997, new facilities continued to be built and old facilities were renovated or demolished. These activities would have resulted in emissions of particulate matter (PM₁₀) in a region that is nonattainment for this pollutant — a continuation of impacts identified in the 1992 EIS/EIR. Other sources of this air pollutant include residential and commercial development, transportation, agriculture, and natural processes.

The operations at the former Tritium Research Laboratory (SNL Building 968) ceased during this period. Emissions of tritium for LLNL were reduced from 1,281 curies to 300 curies, a fourfold decrease (DOE 1992; LLNL 1998).

Since the 1992 EIS/EIR was published, the California red-legged frog and the white-tailed kite have been discovered at LLNL. The kite is state protected and the frog is federally protected. LLNL has consulted appropriate regulatory authorities and has implemented mitigation measures for protection of these species (see Section 3). Other regional sources of impacts to these species include land development and habitat modification.

9.3 ANALYSIS OF PROJECTED CHANGES FROM 1998 TO 2002

Employment for the period 1998 to 2002 is expected to remain stable (see Section 2.1). Thus, LLNL's contribution to the following regional cumulative effects should not increase: (1) regional and local trends in socioeconomic impacts, (2) demand for community services, (3) regional development, (4) highway noise and traffic congestion, (5) mobile source emissions, and (6) demand for water and other utility services. Because LLNL workforce and payroll are expected to be stable and very small compared with expected regional economic growth, a change from a projected increase in workers (1992 EIS/EIR) to a stable condition would have little influence on regional socioeconomic trends.

LLNL's contribution to adverse cumulative impacts related to regional development should continue to decline for vegetation; fish and wildlife; threatened, endangered, and other special status species; and wetland loss. Mitigation measures related to vegetation and wildlife; sensitive, threatened, and endangered species; and protection of wetlands will continue to be implemented to reduce LLNL's contribution to regional habitat losses and to impacts to these resources from regional development.

LLNL's water requirements remain within the bounds of those projected in the 1992 EIS/EIR. Water use declined from 400 million gal annually (average of 1.1 million gal per day)

in 1986 to 239.7 million gal annually (average of 0.66 million gal per day) in 1992. The 1992 EIS/EIR projected that by the year 2002, water use would increase by 9% to 261.3 million gal per year. Projected water demands for the Livermore site, including the NIF and the TSF, is 264.8 million gal per year, substantially similar to the 1992 projections (Zahn 1999). The San Francisco Water Department supplies water from the Hetch Hetchy Aqueduct system, which may reach a capacity of 400 million gal per day (San Francisco Public Utilities Commission 1998). The Alameda County Flood and Water Conservation District, Zone 7 Water Agency (backup supply), distributes about 36 million gal per day (Zone 7 Water Agency 1998). The LLNL water demand is a small fraction of water available from its suppliers. As for any other user, water demand by LLNL contributes to the cumulative effect on water needs of industry, domestic usage, and agriculture in the Livermore Valley. Because LLNL projected water use in 2002 has not changed substantially from 1992 projections, cumulative water use impacts remain substantially the same.

The projected year 2002 annual power consumption, based on current LLNL plant engineering estimates, is 474.2 million kWh. This figure includes the addition of all new building loads, including those for the NIF and the TSF. Although the power consumption for 2002 is projected to exceed the amount forecasted in the 1992 EIS/EIR (376.5 million kWh), the impact would not be significant because the LLNL electrical infrastructure capacity exceeds peak demands by a large margin (Zahn 1999).

U-AVLIS operations would release negligible amounts of airborne uranium that would be below the detection limits. The NIF operation may release 10-30 curies of tritium per year. These releases, together with the 1997 release levels (300 curies per year), are well within the tritium releases reported in the 1992 EIS/EIR (1,281 curies per year). The cumulative doses are well within DOE guidelines for protection of the public and are within the EPA annual dose limit of 0.01 rem for airborne releases under the National Emission Standard for Hazardous Air Pollutants (40 CFR 61). They are also lower than the National Council on Radiation Protection and Measurements negligible individual risk level of 0.001 rem per year. No supplementation of the EIS/EIR is needed with respect to normal operational releases.

The Contained Firing Facility at Site 300 was proposed to be designed to permit experiments that would involve tritium (DOE 1996b, Appendix J). The facility design has been changed, however, to eliminate that capability because of cost. No tritium-containing experiments are planned for the Building 850 Hydrodynamic Test Facility either. Thus, tritium-containing experiments at Site 300 may still be conducted as outlined in the proposed action of the 1992 EIS/EIR or would be done at the Nevada Test Site. Therefore, no changes in the impacts are expected from conditions that would have applied in 1992.

Regional waste generation is expected to increase within the Livermore area due to economic and population growth. However, the impacts of LLNL on regional waste management are expected to continue to be moderated by pollution prevention practices, increased efficiency of waste handling, and improvements in waste treatment and disposal facilities at the site.

PCB-containing capacitors discovered at the NIF site have not contaminated groundwater and have already been remediated (see Section 7). These materials would not contribute to any regional groundwater contamination from past LLNL operations or other sources. Ongoing remediation efforts at LLNL are expected to help reduce existing or potential contaminant events.

The Livermore region is in nonattainment for suspended particulates (PM₁₀) in the air. During the years 1998 to 2002, the NIF and other facilities will be constructed, and these construction activities will result in periods of particulate air emissions (PM₁₀). These impacts for the NIF have been analyzed in detail in the SSM PEIS (DOE 1996b) and supporting documentation (Lazaro et al. 1996). Those studies found that the ambient air quality impacts associated with site clearing would be limited to the area just outside the site boundary. Site clearing would last for a month, so this air quality impact would be temporary. No other federal or non-federal actions have been implemented or are reasonably foreseeable that would interact cumulatively with PM₁₀ emissions during site clearing.

To maintain the 100-year flood capacity along Arroyo Las Positas, LLNL has proposed a program to control vegetation and siltation. Maintenance of the arroyo could potentially affect the California red-legged frog, and LLNL has completed a formal consultation process with the FWS. The FWS has issued a Biological Opinion that reaches a "no-jeopardy" conclusion and includes mitigation measures to minimize impacts to this species and compensate for loss of habitat (see Section 3). LLNL's process of identifying species of concern, consulting appropriate regulatory authorities, and proposing and implementing project-specific mitigation was established in the 1992 EIS/EIR and continues to be implemented.

The trend of increasing economic and population growth in the LLNL region is expected to continue through the year 2002. The regional cumulative impacts projected today for the years 1998–2002 are expected to be substantially the same as those from 1992 to 1997. No other federal or non-federal major projects have been implemented or are reasonably foreseeable that would modify these trends. No other federal or non-federal actions have been implemented or are reasonably foreseeable that, in combination with LLNL and SNL activities, could have an adverse cumulative impact not anticipated in the 1992 EIS/EIR. Supplementation of the EIS/EIR for cumulative impacts is not needed at this time.

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